October 1, 2012

Re: Comments on Urban Forestry Management Plan Update Draft

I want to preface my comments on the Urban Forest Management Plan by appreciating the efforts of the City of Seattle, the Green Seattle Partnership, and volunteers. A tremendous amount of planning and thinking has gone into the organization of restoration, and a tremendous amount has been accomplished.

I previously sent 2012-07-14 Restoration Suggestions that focused on forest restoration practices, but I would like to comment on broader policy, with some redundancy. I want to acknowledge my bias as a restoration contractor having a business interest and a close view of restoration practices.

I will **bold** the page number and section that I am addressing, plus italicize the DRAFT statements between quotation marks, then organize my comments as lettered points.

**1.2 Environment Values, p. 5**: "*The urban forest acts as the lungs of the city…*"

a) Certainly trees and forests do absorb carbon dioxide and act as "filters, sponges, humidifiers, heat shields and wind blockers" (Gary Moll, American Forests). The point I believe needs emphasis is that the urban forest also acts as the kidneys of the city, its topsoil, duff (fungal layer), and woody debris slowing and filtering polluted stormwater runoff. Soil with a healthy fungal layer is the foundation of native plant and future forest health, and any loss of soil health will affect water quality and Puget Sound.
   i. Our cultural practice of manually uprooting weeds (disturbing soil structure, resulting in erosion, soil compaction, and new weed germination) needs to be assessed. "Slow, insidious soil erosion threatens human health and welfare as well as the environment (http://www.news.cornell.edu/stories/March06/soil.erosion.threat.ssl.html)." In the study cited, manually uprooting crop residues may be comparable to manual weeding methods in gardening, landscaping, and current restoration practices.
   ii. Numerous studies document the filtering benefits that microbial activity in raingarden soils offer to stormwater. Paul Stamets in Mycelium Running documents the benefits of fungal filtration from decomposing woody matter, as does a People for Puget Sound study that illustrated the effectiveness of mycelium in raingardens: http://pugetsound.org/science/puget-sound-science/reports/mycoremediation-pilot-project-near-the-dungeness-river/view.
   iii. Losing any topsoil or woody debris will reduce stormwater interception and filtration, and this will affect water quality and Puget Sound, including orcas and humans who consume local fish.
   iv. Topsoil quality is important not only during storm events, but in periods of drought. "Soil both purifies and stores water," (Chris Maser, Our Forest Legacy, 2005). Enhanced water storage in soil may reduce the risk of wildfires (Note: too much woody debris without ground contact can also increase fuel loads and the intensity of wildfires).
   v. Cleaning landscapes and sending organic matter off site for composting only to be transported and bought back as a source of nitrogen pollution – although less than chemical fertilizers – certainly has effects on water quality, particularly if compost is not applied during the growing season or topped with woodchip mulch.
   vi. Even industrial farms are changing to "no till" methods. While the urban landscape isn't nearly the area of farming, the higher concentrations of pollutants in cities suggests that we review City practices. Like many environmental problems, it's the cumulative impacts that add up to breach ecological tolerances.
   vii. The Draft UFMP speaks of "soil(s)" only 7 times, mostly in reference to improving the soil for street trees in concrete planting boxes. Comparatively, "tree(s)" are mentioned 707 times, perhaps reflecting a lack of appreciation of soil's importance to future tree health. "Soil not

only supports all plants growing in it but also supports myriad hidden processes that are necessary for its fertility and healthy forests" (Chris Maser, The Redesigned Forest, 1988).

viii. City programs and SPU newsletters provide an opportunity to educate city crews, citizens, and volunteers about the value of keeping organic matter on site and spreading woody debris as sheet mulch to capture leaves and slow runoff, rather than concentrating debris in large piles or sending it offsite.

ix. The City's Pesticide Reduction Policy prevents better soil preservation practices, and needs to be reviewed according to science-based criteria. I suspect cut-and-treat applications of herbicide are more gentle on soil, leaving roots intact to slowly decompose, and, again, preventing soil disturbance/compaction. City government should be able to "adaptively manage" changing conditions, now that we're in the middle of an invasive epidemic in expanded acreages not considered in the original policy.

**1.2. Social Values, p. 5:** Restoring forests and salmon habitat as a gesture of reparations to the Duwamish Tribe (who remain without treaty rights) would have an immeasurable *social value* for its own sake, but I would speculate there would also be an economic *return in investments* for a port city with world-class aspirations, consistent with the "*triple bottom line*" (p.30).
The Duwamish Tribe should have an opportunity to partner in the development of the Urban Forestry Management Plan, and urban forests near their newly established Longhouse and Cultural Center should have high priority for restoration.

**2.2 Interdepartmental coordination (p.10):**

a) Some city employees complain there are challenges coordinating and communicating even within one department. It's probably understaffing, but from the point of view of a contractor, there appears to be a lack of consideration for our need to know city plans, because we need to manage work flow for employees who have no idea if they'll be employed beyond the current contract.
b) More cooperative efforts are needed to address invasive seed sources in local "seedsheds." SDOT, SCL, and Parks properties can harbor seed sources that infect adjacent greenspaces at perhaps a faster rate than restoration is being accomplished. If City departments can't cooperate in addressing a communal problem, how can private property owners be expected to cooperate? The City needs to lead by example, and publicize the reason behind its efforts.
c) Street Trees programs need to support forest restoration efforts by prioritizing the replacement of invasive street trees (hawthorn, green ash, sycamore maple, Norway maple).
d) Any delay of invasive control efforts will make future efforts more costly for all departments, taxpayers, private land owners, and land managers beyond the city.
    a. ***Table 1:*** *"Seattle City Light is responsible for ensuring safe and reliable power… through environmentally responsible management."* Add to this fiscally responsible management. Trained staff needs to maintain vegetation before it becomes a more expensive problem interfering with power lines. This includes managing invasive seed sources in right-of-ways that infect restoration sites. Fiscal responsibility also means ratepayers paying the full cost of preventive maintenance by adjusting the price of electricity - as opposed to being subsidized by neglect.
e) Seattle Parks could better enhance riparian areas in golf facilities, and remove a landscaping dam in the West Seattle Golf Course that prevents salmon passage through Longfellow Creek. SPU has invested millions of dollars in habitat restoration above the dam in Longfellow Creek.

**2.2. Environmentally Critical Areas (ECA) regulations (p.14):**
Environmental regulations are likely to encounter resistance: the paperwork is cumbersome if not punitive, regulations are difficult to enforce, and they unnecessarily criminalize the homeowner for doing yardwork.

Hired help is put in the position of informing on clients who are breaching the regulations, or losing the work to someone else who is less conscientious.

a) ECA (Environmentally Critical Areas) filing requirements can prevent voluntary restoration. In my contracting experience, 1 in 10 homeowners has the awareness or inclination to file CAM 331 paperwork, much less the time or money to do voluntary restoration. If invasive weeds cross boundary lines (knotweed that requires herbicide, for example), the chances that two adjacent property owners will both file ECA paperwork and wait for the SEPA review (required if herbicide is to be used) are further diminished to 1 in 100. Therefore there's no point for one owner to move forward if re-infestation is imminent.
b) The resulting widespread inaction on invasives might create a worse problem than any overzealous clearing that the ECA paperwork is trying to prevent. Neglect of ivy is found to exacerbate landslides, not to mention the unknowns of diversity loss. Selective herbiciding of ivy on a slope might be a safer approach than manual removal, but regulations discourage such on-site judgments.

**2.3 Volunteer Opportunities (p. 15):**

There are pluses and minuses to relying on (1) volunteerism vs. (2) professional contracting for restoration:

(1) Volunteerism

a) Trained, dedicated volunteers can indeed help with detail diversity and watering new plants that would be too costly for professional crews.
    i. Consider allowing forest stewards with tested ID skills to use herbicide on invasive trees: holly, hawthorn, laurels, etc.
b) The broad marketing required to attract enough volunteers often results in excess transportation, usually by car, and this is not sustainable or consistent with environmental goals. If there were one realm in which we should try to build healthy communities without ignoring transportation pollution, it should be restoration, which should at least try to be more locally based.
c) Education of volunteers is worthwhile, but it doesn't necessarily translate into action.
    i. Volunteers are not educated about their contribution to polluted stormwater resulting from driving to an event to manually remove invasives that leads to loss of topsoil that otherwise might filter the air deposition of their pollution. Is there any measure of gallons of gasoline used per volunteer hour?
    ii. There's little appreciation of the fact that individual actions (of driving, and of topsoil loss) add up to an accumulated effect.
    iii. The educators are not necessarily sharing best practices with volunteers.
d) It may be better education to properly weight incentives listed in section 2.3.
e) Volunteers (or contractors) can introduce weed seeds if managers are not insisting on boot hygiene.
f) Large volunteer groups can do tremendous damage to a site trampling native plants and compacting soil.
g) Citizens really should have an opportunity to "give back" to the environment, and it's important that local stewardship do more good than harm.
h) Volunteerism has race and class dynamics. Not everyone has the leisure time to volunteer. Many people are more concerned with economic survival for themselves and their community, so many people have uncounted volunteerism devoted to justice, homeless or hunger issues. There may be little empathy for problems created by European Americans, particularly when European Americans haven't adequately addressed current/historic injustices. The consequence of different class groups not being able to volunteer could be added guilt, disfranchisement, or "internalized oppression."

(2) Professional contracting:

a) Volunteerism as a policy takes advantage of an idle labor force, rather than viewing forest decline as an opportunity to solve an unemployment problem. Green jobs, assuming funding, need to be nurtured – not just as an ecological necessity, but as a crucial component of economic recovery.
b) I believe the best education volunteers receive is how hard the work is. To be sustained, it needs to be valued enough to be paid work.
a) If there were a funding source, Green Jobs in restoration could reduce joblessness. Full employment is the foundation of a working economy, and I believe the City recognizes the value of shared economic prosperity. Restoration work could easily dovetail with Seattle's Jobs Plan, plus help address homelessness with livable wage jobs.
c) The City could make contracting requirements less onerous, thus better supporting young businesses.
    a. Young businesses would benefit from working alongside different contractors who can share techniques, rather than always hiring one contractor per site.
d) Trained professionals are needed to employ herbicide to remove invasives which is required to better preserve topsoil. Parks should verify the ID skills of its professional crews.
e) Understaffing in Parks' Forestry Department prevents better exchange of information and practices in the evolving field of restoration.

**2.3 Incentives (p. 16):** *"Stormwater Rates: SPU considers land cover in their calculation of stormwater rates for larger property owners."*

b) Stormwater pollution, the continued loss of tree cover, and the spread of invasives demand a serious response that engages all properties, public and private. Incentives are more likely to elicit cooperation, and there's no better educator than properly weighted incentives. A regulatory approach is too little, too late, and unnecessarily criminalizes yard work, resulting in neglect.
c) The City should partner with different agencies to simplify and combine drainage (SPU), conservation (King Conservation District), and any applicable utility fees (King County?) so that incentives could be applied to a larger dollar amount.
d) An additional Invasive Species utility fee should be levied, if an incentive program is in place such that invasive-free properties would incur no additional costs from this fee. This considers the cost of invasive control to other land owners, forest industries, and taxpayers, and the general loss of land value due to invasive neglect.
e) Incentives should be available to properties of all sizes, be simple enough to be realized, and be repeated annually, if not monthly.
    a. One-time rebates, such as in the Rain-Wise program, may not garner the cooperation needed to make a difference for Puget Sound.
f) A simplified incentive program might take the form of an environmental rating that measures (1) tree cover; (2) invasive species control (diversity and habitat value); (3) stormwater management capacity; (4) soil health; (5) nearshore improvements; (6) care of adjacent rightt-of-way vegetation; (7) and other land-use measures with environmental benefits (density in urban growth centers, for example). It might be based on DPD's Green Factor and/or The National Green Values Calculator (http://greenvalues.cnt.org/national/calculator.php).
g) The environmental rating could be measured by certified, perhaps independent, consultants who could also offer resources to improve ratings. Certification training might be coordinated by King County or King Conservation District.
h) Incentives that properly value vegetative cover over native habitat value could encourage better restoration practices on private land, by encouraging the removal of invasive vegetation at the rate that native plants establish.
i) Collective incentives could motivate care of adjacent greenspaces for entire neighborhoods or "eco-districts." Collective incentives would also activate peer policing and minimize the gleaning of plants or woody debris for firewood.

j) Stewards in private yards may be a key component of species preservation in the context of climate and habitat changes.

**4. Challenges and Opportunities; Balancing multiple goals, p. 23:**

a) The best way to balance tree canopy goals, view desires, density goals, and other competing concerns is to appropriately weight incentives that better encourage private cooperation with public benefits.

**4. Challenges and Opportunities; Freight Mobility, p. 25**

a) The problem of pollution that freight industries impose on the region is an opportunity to partner with port interests to fund reforestation that will mitigate such pollution. This is consistent with the Port of Seattle's stated goal to be "the cleanest, greenest port in the nation… in a new era of social responsibility."

b) Cement kiln dust, a by-product of freight mobility, was allowed to be deposited into the West Duwamish Greenbelt (allegedly sanctioned by a past Parks' official). This continues to affect forest health and water quality in the Lower Duwamish River. In particular, it affects the aspirations of the Duwamish Tribe, which desires to daylight a restored Puget Creek into salmon habitat estuaries near the Duwamish Tribe Longhouse. Again, the proximity of the Longhouse to the largest contiguous forest in Seattle (the West Duwamish greenbelt) suggests that this forest be considered a priority for restoration.

**4. Challenges and Opportunities; Climate Change, p.26**

a) City of Seattle doesn't seem to be as concerned about fossil fuel use as it is about herbicide use (which is far less toxic).
    i. Parks trucks are notoriously seen being driven around, to the point that it's become an institutional joke.
    ii. There are many hard-working, environmentally conscious City employees. However, I've witnessed Parks employees idle their trucks to warm their hands – and not during breaktime. I suspect much driving is for trash pickup, an important measure of pest control, but I've seen the same Parks' truck drive back and forth no less than 4 times within an hour, apparently for a forgotten tool. I've seen employees drive 3 miles to a City bathroom facility, when a SaniCan was 300 yards away. Similar stories of inefficiency are repeated at many public meetings.

b) Excessive fossil fuels are consumed for mowing in the face of rising rates of asthma, missed opportunities to convert lawns to improved habitat, and the waste of tax dollars pursuing an advertised visual expectation (the green lawn "look"). I can't offer simple answers, and any recommendations would likely encounter institutional resistance. However, I do think that city employees more likely to create their own cost-saving solutions that also benefit the environment if they are awarded 5% of the cost savings of innovations that still accomplish public goals.

c) City of Seattle departments should hire local contractors who are based as close as possible to work sites, as opposed to contractors from different counties. This would reduce carbon footprints, as well as "*facilitate transportation" (p. 4)* instead of gridlock.
    a. I've seen SPU hire crews from Tacoma to do restoration work in West Seattle (due to contract parameters), and Parks regularly hires crews that commute from Chehalis. Many in-city crews have charged for cross-city travel time when closer crews are available. There may be compelling reasons to hire distant companies, but greenhouse gas emissions seem not to be factored in for work that should encompass environmental values.

d) The contract/bid process of hiring and paying contractors needs to be reviewed. Many jurisdictions post contract awards on-line. Transparency may help the bid process be more competitive, plus ensure that contractors are being paid enough by the City to pay employees Paid Sick Leave and pay themselves the prevailing wage.

**5.1. Goal; Age and Species Diversity, p. 29: "***Striving to replace 1-2% of our trees every year will result in a more diverse age distribution that will support sustainability of our urban forest."*

a) 1-2% replacement rates don't match the projected "70% loss of tree canopy in 20 years" (http://www.cascadeland.org/stewardship/green-cities/), even if replacement trees could reach mature heights in such a short time.
b) The tree age-diversity goal should be balanced with the need to increase evergreen tree canopy for the sake of stormwater interception, carbon sequestration, and the suppression of shade-intolerant weeds. I would err on the side of overplanting all available sites ASAP and assume enough mortality or ability to later thin trees as needed (something Parks is reticent to do). Plus, the capacity to replant at later dates could accomplish the goal of age diversity.
c) I expect significant mortality of trees planted in early restoration efforts due to pot-bound or test-tube plugs resulting in root-bound trees without the structural strength to persist much beyond the usual timing of tree farm rotations.
d) Structural diversity in forest remnants is important, but such diversity already exists in our urban landscape with right-of-way edges and varied landscapes in private property. Again, I would err on the side of dense plantings that could later be thinned.

**5.1. Goal; Invasive Species, p. 29:** "*…continue to support programs such as the Green Seattle Partnership that will remove these invasive plants from our urban forest over time to the point where routine maintenance will be sufficient."*

a) It is my view that the plot-by-plot restoration strategy of GSP is not keeping pace with the rate of re-infestation. As I outlined in 2012-07-14 Restoration Suggestions sent earlier, "addressing an invasive epidemic is fundamentally different fron (GSP) 'tree-iage' criteria used to select restoration sites." If the City can increase its efficiency with herbicide tools, perhaps it will be easier to find additional funding sources to sweep all available land in waves to reduce invasive sources of re-infestation (particularly ivy, which goes to seed mainly when it climbs vertically on trees) as a supplementary effort to support existing GSP strategies. Such an "ivy ring" sweep was attempted years ago, but vines were not treated with herbicide and grew back faster than necessary. An invasive sweep targeting seed sources with herbicide might be 10-20% the cost of full restoration, and could reduce the re-infestation rate if a public education campaign coincided with the effort.
b) We need to better articulate the threat of invasives, for example: One of many species threatening forest health, English holly, is approaching a density of 900 stems per acre in local urban forests, where holly outnumbers native tree regeneration 9:1 (Mercer Island Forest Health Survey, 2008). The spread of English holly is on a near exponential curve, doubling every eight years, and "has the potential to become a dominant species both in number of individuals and area covered within a few decades"(Dr. David Stokes, http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds/weed-news/mar2012.aspx). Holly is long-lived (300 years) and can reach heights of 80 feet. Both ivy and holly, able to germinate in the complete shade of coniferous forests, are already showing up in wilderness areas.
c) The long-term severity of the invasive threat to regional forest health, diversity, and ecosystem services cannot be understated. The long-term health of salmon is at stake. The timber industry will be affected. Flooding will be more frequent. Tourism will be affected. Already one quarter of U.S agriculture's Gross Domestic Product is lost to foreign plant pests and the costs of control. Economic decline will be preceded by environmental loss impossible to quantify, and perhaps irreversible. This slow-motion emergency of invasive plants warrants an official response appropriate to the threat. The longer we wait, the more expensive the required response will be.
d) As another opportunity for *Interdepartmental Coordination*, public health agencies need to assess the health threat posed by stormwater and its "14 million pounds of toxins entering Puget Sound each year" (http://www.12000raingardens.org/about-the-campaign.html). Stormwater quantity and toxicity will increase with any loss of tree canopy and soil health. Health agencies also need to assess

the potential health threat posed from a reduction in plant diversity. It is known that ivy (cover from predators) and food sources (blackberry, bird feeders, rotting fruit) together provide habitat for rodents that can carry human diseases, and that neglecting habitat diversity can increase the risk of disease spread. "High biological diversity … is hypothesized to protect against human and wildlife diseases (Lyme disease, West Nile Virus, SARS, and Hantaviruses), and reduced disease spread or prevalence has been recognized as an ecosystem service." (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2673579/). This needs to be considered in the context of climate change exacerbating disease spread (http://grist.org/climate-energy/seven-climate-change-diseases-to-ruin-your-monday/).

i. Human cultural practices that favor disease hosts need to be addressed:
    i. Grass lawns can attract geese and pollute nearby water bodies, causing "swimmer's itch." (http://green.kingcounty.gov/swimbeach/FAQs.aspx). Buffers of native shrubs can deter geese and filter runoff.
    ii. Growing crow populations may be susceptible to West Nile Virus that can infect humans through infected mosquitos. "Private citizens, landscape architects, urban planners, and developers can limit crows simply by reducing lawn cover and increasing shrub and tree cover in yards, parks, and neighborhoods" (In the Company of Crows and Ravens, John M. Marzluff and Tony Angell, 2005).
    iii. Mosquitos find breeding habitat in litter, primarily tires and water-holding containers, deposited throughout our green spaces. A progressive litter management policy is needed, one that reduces litter at its source (a packaging/bottle tax/deposit that pays for cleanup).
    iv. A progressive manure management policy is also needed for pet waste that can contain Roundworms, E. coli, and Giardia. 200 tons of pet waste are deposited in the Puget Sound region *every day*, and stormwater flushes some of it into lakes, streams, and Puget Sound (http://www.kingcounty.gov/environment/waterandland/stormwater/videos/pet-waste-stormwater.aspx). I would suggest a peer accountability policy that would measure fecal coliform levels and levy a pet-waste fee on pet food accordingly. As coliform levels go down, so would the fee. The revenues raised could pay for myco-remediation (burlap bags filled with woodchips, placed 2-deep around waste sources).
    v. The public is largely aware that pet waste is best picked up with a plastic bag, sealed, and disposed in a trash can – not composted in the back yard. Cat waste should not be flushed down the toilet. Like dog waste, it should also go in a plastic bag and into the garbage. A particular pathogen in cat waste is not treated in waste facilities.
    vi. Unkempt bird feeders are not just a food source for rodents that can spread disease, but lack of hygiene can spread disease among birds and humans (http://www.nwhc.usgs.gov/publications/fact_sheets/coping_with_diseases_at_birdfeeders.jsp).
        1. Bird populations are being decimated by feral cats, which "kill 480 million birds in the US every year" (http://ianrpubs.unl.edu/live/ec1781/build/ec1781.pdf). Birds are an important check on insect numbers, expected to increase from climate change. Unchecked insects can affect human health and of course forest health.
            a. Feral cats carry rabies, hookworm, and toxoplasmosis, an infection known to cause miscarriages and birth defects in humans.
            b. Pet owners should be strongly encouraged to keep pets they care for indoors when not being supervised, and to not feed feral cats.

e) There may be an epidemic parallel to exotic plant introductions: for every 7 alien plants introduced, 1 becomes a significant problem. In a dynamic environment with declining biodiversity, with climate

change, and with global travel introducing new and tropical diseases, risks of disease outbreaks increase. "On average, there is a newly recognized infectious disease every year that surprises us and there is every reason to believe that will continue (Dr. Bill Foege, former director of the Centers for Disease Control)." Epidemics are not without precedent. We must take seriously the recommendations of ecologists and epidemiologists and create policy that minimizes risk factors. The consequences of epidemics may be beyond our locality and beyond our control.

f) Rodenticides and insecticides may be used in a human disease outbreak. Far less toxic herbicides may help retain diversity that could suppress such outbreaks. Similar to the benefit/risk of using DEET in malaria-prone regions, the benefits of using specific herbicides should be weighed according to science-based assessments of health and environmental risks and not rejected due to general fears of all pesticides.

**5.4 Table 8: Action Agenda for the Urban Forest Management Plan, p. 33): "***Identify and prioritize invasive species removal from City properties."*

a) The above quotation is listed under "Mid-term actions (5-10 years)." At the rate invasive species are spreading (holly numbers are doubling every 8 years), waiting 5 or 10 years will be very expensive. Invasive sweeps for fruiting seed sources should be conducted in the short term, within 5 years.

**6. Research agenda (p.36): "***Analyze research that provides quantitative data on the benefits of trees as a Race and Social Justice issue for community improvement and cultural engagement."*

a) Also analyze research about the soil degradation from the City's manual weeding practices, and how those practices, as compared to herbicide methods, affect soil loss and stormwater filtration. Consider the Race and Social Justice issue of immigrants and people of color who disproportionately bio-accumulate stormwater toxins when they eat local fish.

b) And analyze research documenting the fact that the Duwamish Tribe is not extinct and that their continuity of governing councils qualifies them for federal recognition. The federal government's failure to honor the Point Elliott Treaty is a *Race and Social Justice Issue* for the Duwamish Tribe and should be a priority for Seattle citizens who prosper on land that has not been paid for, especially considering the federal government's inaction. Citizens share a moral obligation to at least repair our environment so that culturally important species are restored, particularly salmon – an obvious necessity to honor treaty fishing rights. "Environmental reparations" should be part of the Seattle's Urban Forest Management Plan, and the City should respect the Duwamish Tribe's wishes to daylight Puget Creek and restore its watershed. Environmental reparations will benefit all residents of Seattle.

Thank you for your consideration.

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